MASS HIGHWAY

Number: E-98-001
Date: 03/13/98

ENGINEERING DIRECTIVE

Thomas F. Broderick
CHIEF ENGINEER

CONSULTANT PERFORMANCE EVALUATION

General

The purpose of this Policy Directive is to document and implement an improved Consultant Performance Evaluation System on a Department-wide basis.

MHD personnel, with the cooperation and assistance of the consultant community, developed an improved Performance Evaluation system. The system allows input from all engineers and managers who review and direct consultant work on engineering projects. This activity documents performance during the project allowing for corrective action to be taken prior to project completion. Feedback may be provided to consultants on an interim basis to provide opportunities for improvements or corrections as necessary during the course of a project.

Performance evaluation is improved since it allows input from the several disciplines involved in a project rather than critiques of the administrative aspects alone. Information thus captured may then be reflected in future selections for contracts, emphasizing specific areas of expertise. It also allows for more objective evaluation by decentralizing review to several individuals and disciplines rather than depending solely on the Project Manager's perspective.

A detailed Final Report which explains development of the system and specific components is included with this Directive (see Attachment 6). This Report provides more detailed and in-depth information than the Directive alone.

Procedure

When a consultant contract is initiated, the Project Manager (PM) will set up a Consultant Evaluation Summary Sheet (see Attachment 5) to record project identification information and any review evaluations that are submitted at certain stages throughout the project. Reviewers will transmit interim performance scores (and

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Distribution: B Please post: _____ Do not post X

comments as appropriate) with the normal review transmittals. A record of the scores and comments will be kept with the summary sheet and sent to the consultant via the PM's Supervisor and the Division Head.

At the conclusion of design, (project advertised for construction bids) information is forwarded to the Secretary of the Architects and Engineers Review Board for incorporation into a data base, and to the consultant for information. Specific information will be made available as needed to assist those participating in the consultant selection process and to the A&E Board for reference as necessary.

Details

Attachments are included to illustrate detailed procedures to be followed:

Attachment 1 - Transmittal memos which request review of consultant submittals shall also include a request for evaluation of the quality of the consultant's design

Attachment 2 - The return transmittal memo shall contain the score (on a basis of 0 to 10) and comments as appropriate.

Attachment 3 - The Environmental Division has a more complex format for evaluation. These reviews and evaluations are expected to be performed within the Division. The final overall environmental score and comments, however, will satisfy the overall Performance Evaluation System; details will be useful to the Environmental Division.

Attachment 4 - This is the Project Manager's Evaluation Form which is the basis for review of administrative aspects of the project such as schedules, budgets, cooperation, etc. It is used by the Project Manager for each project assigned to the consultant.

Attachment 5 - The Summary Form is the direct basis of the Final Evaluation. All other evaluations are compiled into this report and combined to yield a weighted score for the project and weighted scores for the individual disciplines listed.

Specific Instructions for the Summary Form:

- Roadway Reviews: Scores will be weighted 30% - 70% for the Project Manager and District respectively. Equal weights will be given for the various stages (i.e."25%"- "75/100%"- "Specs&Est" stages will be 1/3 each).

- Bridge Reviews: Weights will be as indicated for various stages of design.

- Traffic Reviews: Traffic components will be equally weighted, 100% being distributed to those activities contained in the subject project.(e.g.. if there were no "signals and lighting, the 100% would be distributed to the remaining three categories)

- Environmental Reviews- Handled in the same manner as Traffic.

- Other: These are discreet categories which will have greater or lesser degrees of importance, depending on the project. As such, they will be weighted based on the relative number of work-hours allotted in the negotiated estimate. The PM will assign these weights.

Work contracted by Cities and Towns will be given a standard set of weights depending on the type of project being designed (e.g. Safety Improvements, Signalization, Drainage Improvements, etc.)

Implementation

Converting to the new system and replacing current evaluation information will require a transition period. Existing evaluations in the A&E Board's files will be pro-rated to the new scale. New evaluations will be more detailed and graded on the 10-scale. Total conversion will be made by continually replacing evaluations which are four or more years old. In four years, all information will be based on the new system.

At present, reviewers who have attended a workshop/presentation are evaluating submittals and returning information to project managers. The next step is to extend the system to all those responsible for reviewing consultants' work.

Effective immediately, all those who are responsible for managing consultant contracts or reviewing consultants' work shall provide evaluations according to the referenced Performance Evaluation System.

THE COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS HIGHWAY DEPARTMENT

INTEROFFICE MEMORANDUM

TO: Sherman Eidelman, P.E., District 4 Highway Director

FROM: Paul A. Patneaude, P.E., Acting Manager/Engineering Expediting

DATE: February 6, 1995

SUBJECT: Billerica - Boston Road @ Pollard and Floyd Streets Safety Improvement

Attachment(s) :
(a) 2 set(s) of 75 % Highway Plans
(b) _____ copy/copies of the Traffic Control Agreement
(c) 2 " " of the Draft Special Provisions
(d) 2 " " of the Estimates
(e) 1 set of marked-up plans from the 25% review

We request your early review of these contract (project) documents.

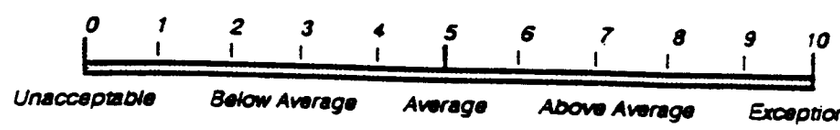
The closing dates for review comments are as follows: (25%) - 30 calendar days : and (75%) - 21 calendar days: (100%) Submission Approval - 14 calendar days; all from receipt date.

NOTE: No additional comments should be needed after the 75% review. 100% Review is to insure that 75% comments were addressed.

Engineering Work Order #091-005-700(1) .
Record Key #006821 .
Project Manager: Bruce Sylvia , Tel. #973-7732

Along with your review comments, please provide this Office with the District's evaluation of the consultant's 75% design, using the scoring range (0-10) shown below. Provide comments where appropriate. Your evaluation score and comments will be used by the A&E Review Board in determining the amount and complexity of future design work assigned to this consultant.

CONSULTANT EVALUATION SCORING:



BJS/bjs
Att:

THE COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS HIGHWAY DEPARTMENT

INTEROFFICE MEMORANDUM

TO: Paul A. Patneaude, P.E. Acting Manager/ Engineering Expediting

FROM: Sherman Eidelman, P.E., District Highway Director

DATE: February 20, 1995

SUBJECT: BILLERICA - Boston Road @ Pollard & Floyd Streets
75% Review Comments
EWO # 091-005-700(1)
Record Key # 006821

The District review of the 75% highway design submission for the subject project has been completed. Review comments are attached.

Please include a written response to all review comments with subsequent submissions. If you have any questions, please contact Mr. James Alexander at 617-648-6100, extension 465.

CONSULTANT EVALUATION:

75% Roadway Design Score: 6

General Comments:

1. Very good job addressing 25% comments, on plans and in writing.

2. Consultant seems to lack knowledge regarding MHD Special Provisions.

3. TMP barely acceptable - needs work.

Attach.
JRA/jra
cc: GRM, DRA, CFN

Attachment 3

MHD ENVIRONMENTAL DIVISION
DESIGN CONSULTANT EVALUATION FORM

PROJECT INFORMATION:

Consultant:
Project Description:
Design Project Manager:

Design Contract #:
Record Key #:
Envir. Eval. Date:

ENVIRONMENTAL REVIEWER EVALUATION:

	Technical Expertise & Knowledge	Clearness, Accuracy & Completeness of Plans Permits & Reports	Responsiveness and Cooperation	Design Ingenuity	Performance at Meetings & Hearings	Overall Score
MEPA/NEPA						
ENF						
EIR						
CE Checklist						
4(f)						
EA/EIS						

Env. Reviewer: *Subconsultant: None* *Overall, MEPA/NEPA:*
Comments:

WETLANDS/WATER QUALITY						
WPA						
404						
401						
CZM						
Ch. 91						
U.S. CG						

Env. Reviewer: *Subconsultant* *Overall, Wetlands/Water Quality:*
Comments:

CULTURAL RESOURCES						
HABS/HAER						
Section 106						
Chapter 254						
Archeology						

Env. Reviewer: *Subconsultant: None* *Overall, Cultural Resources:*
Comments:

*HAZARDOUS MATERIALS **						
Overall						

Env. Reviewer: *Subconsultant: None* *Overall, Hazardous Materials:*
Comments:

ENVIRONMENTAL DESIGN REVIEW						
25% / 75%						

Env. Reviewer: *Subconsultant: None* *Overall, Envir. Design Review:*
Comments:

OTHER:						

OVERALL QUALITY OF DESIGN WORK: *Overall Environmental Score:*

CONSULTANT EVALUATION SCORING:

0 1 2 3 4 5 6 7 8 9 10

Unacceptable *Below Average* *Average* *Above Averag* *Exceptional*

Form ENVEVAL, Revised 12/31/92

PERFORMANCE EVALUATION ARCHITECT–ENGINEER PROFESSIONAL SERVICES CONSULTANT	P/E EVALUATION

Name & Address of Consultant	Location & Description of Project
Type of Services	Complexity of Project

CONTRACT DATA

Contract No.	Date of Contract	Notice to Proceed	Estimated Completion Date
Method of Payment	Amount of Fee		Maximum Obligation

Description and Costs of Sub–Contracts (if any)

Amount of Direct Costs	Percent of Work Completed	Percent of Fee Billed

PERFORMANCE:

Overall P/E Evaluation

0* 1* 2* 3* 4 5 6 7 8 9 10

Unacceptable Below Average Average Above Average Exceptional

Responsiveness and Cooperation		Efficient Use of Manhours	
Involvement of Key Personnel in Engineering Services		Ability to Work Within Budget Amount or Fee	
Manner in which Work was Organized and Accomplished		Promptness in Submission of Data and Plans	
Clearness & Completeness of Presentation		Local Office Staffing and Equipment	
Evidence of Ingenuity and Experience in Design		Capability for Doing More Complex Work	
Performance at Public Hearings and Other Meetings		Preparation of Invoices and Other Billing Material	

Reasons for Delays (if any)

REMARKS:

Division or Section Managing Work:

Submitted by: _____ Title: _____ Date: _____

Approved by: _____ Title: _____ Date: _____

This form to be submitted by Project Manager to Secretary of the Architects & Engineers Review Board annually and at completion of work (not including construction stage) or at any other time when such a report may be pertinent.

* Give further explanation under remarks or on attached sheet.

perform3.wk3

QUALITY OF DESIGN
CONSULTANT EVALUATION SUMMARY FORM

PROJECT INFORMATION:

Consultant: _____
Project Description: _____
Project Manager: _____

Design Contract #: _____
Project File #: _____
Design Eval. Date: _____

ROADWAY REVIEWS:

	Plans: 25%	Plans: 75%/100%	Specs & Estimate
District (Projects/Construction)			
Project Manager			
	70%/30%	70%/30%	50%/50%

Roadway

BRIDGE REVIEWS:

Bridge

Type Study/Sketch Plan.	35%	
Final Design	35%	
Specs & Est.	30%	

ENVIRONMENTAL REVIEWS:

Envir.

MEPA/NEPA	
Wetlands/Water Quality	
Cultural Resources	
Hazardous Materials	
Design Plans	
Other:	

TRAFFIC REVIEWS:
(At 75/100% Review)

Traffic

Signs/Pavement Markings	
Signals & Lighting	
Operations/Safety Management	

OTHER REVIEWS:

Other

Geotechnical	
Hydraulics	
Landscape	
Right of Way	

PROJECT MANAGER:

Proj. Mgr.

(See Project Manager Evaluation Form)

OVERALL QUALITY OF DESIGN:

	Rdwy	Bridge	Envir.	Traffic	Other	Proj. Mgr.
Evaluation:						
Weight:						0.20 Fixed
Wt. Score:						

Weighted Score

CONSULTANT EVALUATION SCORING:

0 1 2 3 4 5 6 7 8 9 10

Unacceptable | Below Average | Average | Above Average | Exceptional

evalcon7.wb3

EVALUATING THE QUALITY OF CONSULTANT DESIGNS

A PLAN FOR IMPROVING THE HIGHWAY DEPARTMENT'S CURRENT CONSULTANT EVALUATION SYSTEM

FINAL REPORT

Prepared By The
Massachusetts Highway Department
Architects & Engineers Review Board

Reviewed and Revised By The
MHD/ACEC Partnership
Performance Evaluation Task Force

May 1997

EVALUATING THE QUALITY OF CONSULTANT DESIGNS
PLAN FOR IMPROVING CURRENT SYSTEM

INTRODUCTION

This report presents a plan for improving the Massachusetts Highway Department's current system for evaluating the quality of consultant designs. These recommendations are a compilation of ideas and suggestions brought forth in a number of committees and workshops, including the following:

- The MHD/ACEC Compensation/Value Task Force - when discussing how to quantify the value of a consultant design. "Value" is determined by how much time and effort MHD personnel must put into reviewing and correcting design submissions as well as the design's ultimate constructibility in the field (i.e. the number of EWOs, claims, time extensions, etc.).

- The MHD/ACEC Cost Recovery Task Force - when discussing the need for better communication between MHD personnel and the consultant regarding the Department's opinion of their work. Consultants want to know how they are doing in the eyes of their client as well as how they "rank" among others. By letting them know their individual strengths and weaknesses, they can take internal steps (e.g. recruiting, training) to improve their designs. Also, as the Department moves toward the direction of cost recovery, much better documentation is needed regarding the quality of the design. This system will help to provide that documentation.

- The MHD Extra Work Order Task Force - when discussing recommendations as to how to decrease the number of EWOs, claims, overruns, time extensions, etc. currently being realized in the field. Besides increasing the cost of construction projects, poor quality designs also have strong cash flow and spending cap implications.

- The Project Development/Highway Engineering Partnering Workshop - with Project Managers from the Environmental Division stating their concern over being left out of the consultant evaluation process. With the number of projects that expeditors must now manage, it is not possible to closely review plans, drawings and other documents. Although the District, Traffic, ROW, Environmental and others are relied on to perform the design reviews, none play a significant role in the design evaluation.

- The A&E Review Board - the Board has also discussed the need for improving the consultant evaluation process, in order to more efficiently identify consultants who have excelled in various fields and to obtain better documentation on which to support the Board's consultant selection decisions.

Although each of these groups examined the issues of quality and consultant evaluations from very different perspectives, they all reached the same general conclusion - that improving the current process would result in considerable benefits to the Department as well as to the design community. Based on input from these groups and others throughout the Department, the A&E Review Board developed a "prototype" for an improved consultant evaluation system. In order to secure input from the design community, MHD management suggested that the MHD/ACEC Partnership create a task force to review the recommendations and comment on them. This final report is the product of that task force.

PROBLEM STATEMENT

In order to make designers more accountable for the quality of their work, the first step is to do a better job defining what the Department means by quality, and then developing an evaluation system that will fairly "grade" their performance based on this criteria. In general, there are two types of costs to the Department associated with poor designs. First, a poor design takes more time to review and correct. Second, a poor design results in more extra work orders and cost overruns in the field. Both of these "quality" issues have been addressed as part of the evaluation system.

A major weakness of the Department's current consultant evaluation process is that the Project Manager essentially has the only voice in the matter, through the consultant "Performance Evaluation" form prepared at the end of the job and submitted to the A&E Review Board. This may have worked well in the past, when expeditors' smaller workload gave them the opportunity to thoroughly review all aspects of the design. Over the past few years, however, nearly all of the review responsibility has shifted outside of the Expediting Section. It is essential that the evaluation process be revised to reflect this, by giving the actual reviewers (the ones wielding the red pencils) the opportunity to evaluate the designer. For instance, the Environmental Division reviews dozens of ENFs each year. These reviewers can tell a quality work product from a poor one immediately, and they know through experience which consultants are able to prepare one correctly. The Department should take full advantage of this experience and give them the opportunity to evaluate the consultant in terms of environmental permitting. With similar input from other Department reviewers (e.g. District, Traffic, Bridge, Geotechnical, ROW), the evaluation could help to point out the stronger and weaker firms (in terms of an overall quality work product), as well as the relative strengths and weaknesses of individual firms (e.g. strong in bridge design, but weak in terms of environmental permitting).

Another shortcoming of the existing process is that evaluations are rarely shared with the designer - unless there is a significant problem. Since there is no formal evaluation performed until after the project is completed, consultants cannot determine how well the Department feels they are doing along the way. By including performance ratings at various stages of the design (e.g. 25%, 75%) and after various tasks are completed (e.g. ENF, Hydraulics Report), the Department's Project Manager will be able to share the evaluations with the consultant on a continuous basis. Final evaluations will also be made available to designers, through the A&E Review Board. By sharing this information with the designers, as appropriate, they will know where they stand in the eyes of their client and can take steps to improve the quality of their work.

It is generally thought that the 80/20 rule applies to consultant designs: that 20% of the consultants are causing 80% of the design problems (both for reviewers and in the field). The Department must do a better job of finding out which consultants fall into that 20% category, and then take steps to make them accountable for their work (including any additional costs to the Department caused by their design errors and omissions). On the other hand, the majority of the designers who consistently provide a high quality work product should be rewarded with future design contracts. An improved consultant evaluation process will help to ensure that this happens.

OBJECTIVE

The short term objective of this system is to improve the quality of designer evaluations by giving all stakeholders in the process an opportunity to be involved in it. With an improved system in place, both the A&E Review Board and individual RFP selection committees will be able to make better decisions in terms of selecting the best qualified designers for specific types of work. By hiring the best qualified designers and making them more accountable for their performance, the quality of designs should improve which will, in the long term, result in less review time and fewer constructibility problems (i.e. extra work orders).

SYSTEM DESIGN CRITERIA

Two criteria were considered when developing this evaluation system - simplicity and usefulness:

1. Simplicity - the system must be easily understood and cannot create an administrative burden. Wherever possible, existing evaluation forms have been revised and not replaced. Vague qualitative scores such as fair and poor have been avoided as much as possible.

2. Usefulness - the output must be both reliable and meaningful in terms of making better selection decisions. All stakeholders involved in the process must feel that the system provides them with a benefit that is worth their extra effort. These stakeholders include:

    - Reviewers - all MHD design reviewers will have the opportunity to take part in the consultant evaluation process. They are the experts in each field and review the same aspects of a design day in and day out. They know the difference between a high quality design and a shoddy one thrown together by a firm's "rookies." Their opinions will help to ensure better designs in the future, which will eventually make their jobs as reviewers much easier. This will also help to get everyone in the Department to "think quality."

    - Project Manager - still plays the primary role in coordinating the evaluation process and preparing the evaluation form at the end of the project. Whereas the actual reviewers will evaluate the specific design elements, the Project Manager will focus on issues such as responsiveness, cooperation, timeliness and budget. Under this proposal, Project Managers from other units (e.g. Environmental, Traffic) would also have the opportunity to provide the A&E Review Board with consultant evaluations for internal (e.g. open ended) contracts.

    - Consulting Firm - will, for the first time, be able to determine what their strengths and weaknesses are, in the eye of their client - the Department - as well as how they compare to the industry as a whole. Once principals understand that future work is dependent on today's evaluations, they should start to take this process very seriously. By pointing out specific weaknesses this evaluation will also help them in their recruiting and training practices, which will eventually result in better MHD designs. Since a designer's final score will actually be a compilation of evaluations from a number of MHD reviewers, there is also less of a chance that one Project Manager may base an evaluation on previous personal experiences with the firm.

- A&E Review Board - will have access to much improved data on the quality of consultant's past work. For example, with a laptop at each meeting the Board could find out which firms have "scored" the best for complex bridge designs during the past three years, or who is best suited for an environmentally sensitive project. The system will also give the Board better information to back up their selection decisions, should they ever be disputed.

- RFP Selection Committees - would also have access to design evaluations for competing consultants in terms of past Department work, typically an important criteria for selection.

PROCESS AND ADMINISTRATION

The evaluation system would work in much the same way as it currently does; a two-part process in which the Project Manager is ultimately responsible for the design performance evaluation and the Resident Engineer is responsible for the constructibility evaluation. There are only five basic changes made to the current system:

1. All Department personnel who are responsible for reviewing a design are given the opportunity to provide input into the designer's evaluation. By evaluating a design specifically for roadway, bridge, traffic, environmental and other categories of work, the Department will be able to determine the specific strengths and weaknesses of individual design firms.

2. Vague qualitative terms such as good, fair, and poor have been replaced with more quantitative numeric scores. These scores will allow the Department to rank consultants. By basing the scores on a "5 = average" benchmark, managers will also be able to ensure that various units are evaluating designers fairly.

3. Evaluation criteria have either been expanded upon or clarified, to ensure that all aspects of the designer's performance are evaluated by the appropriate person.

4. The A&E Review Board will have access to a more complete data base which includes data on type of work, size of job, complexity of design, and performance rating. By including all of these criteria, and consolidating the design and constructibility reviews, the Board will have a meaningful overall index, or score, to assist them in making selection decisions.

5. By enhancing the lines of communication regarding quality issues (both informal on a continuous basis and formal at the end of the job), this system will serve as a partnering tool for all MHD projects - even when a more formal design partnering relationship may not be warranted.

The attached forms and memos show how the system might work. A brief description of each follows, along with a discussion of how the system might be administered in practice.

Attachment 1: The Project Manager's form letter (as sent to the District and Traffic) has been modified to include a request for evaluation by the reviewer - shown at the bottom of the memo. It explains that the reviewer's input will be used by the A&E Review Board in determining the amount and complexity of future design work assigned to this consultant. Once reviewers realize that their input makes a difference, they will

be more willing to actively participate in the review. The evaluation is based on a score of 1-10, with 5 being "average." One problem with existing evaluations is that everyone perceives terms such as "fair," "good" or "excellent" differently. Basing evaluations on "average" is much more meaningful, while enabling the Board to monitor consistency in scoring in each category over time, based on a bell curve distribution.

Attachment 2: When the design review is completed, the reviewer (in Traffic or the District) would simply include the evaluation score and any comments on the return memo. Other units, such as Geotechnical or Hydraulics, could include comments in a similar way, on their transmittal letters.

Attachment 3: For the Environmental Division the process will be slightly different, because often times a document (such as a CE Checklist or ENF) may need to undergo multiple iterations before it is satisfactorily completed. In this case, the appropriate Environmental Project Manager may wish to evaluate the consultant after the permits are approved, instead of for each submission. Attachment 3 has been developed by the Environmental Division as a means to evaluate performance once the permitting stage is complete. By evaluating each environmentally-related task separately, it helps to differentiate between minor and major permitting work based upon its complexity; for instance, preparation of an ENF versus an EIR under the MEPA/NEPA category. A firm which is very adept at preparing an ENF may not necessarily have the ability to prepare a more complex EIR. Although only the overall scores would be included in the evaluation "Summary Form," both the A&E Board and the Environmental Division would have access to the detailed evaluations - either on a case-by-case basis or to "rank" consultants for a specific task (e.g. EIR preparation). For open ended and other contracts within the Environmental Division, the Project Manager would submit a single form to the A&E Board, which would resemble Attachment 4.

Attachment 4: The only modifications to the existing Project Manager Evaluation Form are the 1-10 rating (rather than poor-excellent) and the addition of two criteria related to performance at public meetings and invoice preparation. The numerical scoring will ensure consistency with the rest of the evaluation rankings and the additional criteria cover areas not specifically noted on the current form. With this form, the Project Manager will have the same input as always regarding issues such as consultant responsiveness, cooperation, ingenuity, promptness, efficiency and ability to work within budget. These are the issues that the Project Manager is most concerned with, as opposed to more technical design issues generally addressed by others. For open ended and other contracts managed by other MHD units (e.g. Environmental, Traffic), the appropriate Project Manager would fill out an evaluation form similar to this.

Attachment 5: Once all reviews (and evaluations) are in, the Project Manager will be responsible for consolidating them, completing the "Evaluation Summary Form," and submitting it to the A&E Review Board as the final evaluation. Although it looks tedious, it is only a matter of filling in numbers (from each of the reviews) onto a spreadsheet, such as Lotus or Excel. The computer program will perform any necessary calculations. The only subjective matter is applying weighted scores to each category of work, depending upon the type of project. Obviously, a bridge project should be weighted higher for bridge scores, whereas a resurfacing job would be weighted higher for roadway scores. The Department initially plans to use two general approaches to weighting a project's scores:

- For MHD negotiated designs - basing weights on the number of manhours negotiated in each category of work (e.g. roadway, bridge, environmental), as presented in the final scope and manhour estimate. This should approximate the relative "importance" of each category as part of the total design effort and is the most quantitative approach.

- For designs not negotiated by MHD - setting up a number of standard weighting categories based upon the type of work involved, and determining which category a project best fits. For instance, a basic bridge job may be weighted 40% bridge, 20% project management, 20% roadway, 20% other. For work that does not fit into a "general" category, the Department may determine weights on a case-by-case basis, either before work begins or after it has been completed.

Attachment 6: The Record of Design (ROD) has also been modified to include more useful data, to categorize the criteria into more meaningful groupings, and to require more written explanations. The ROD will be filled out as part of the finals process, as is done today. The A&E Review Board will still be responsible for giving the designer a final numeric score, based on the Resident Engineer's input. It will need to be stressed within Construction that these RODs are a vital tool in ensuring that poor quality designs do not make their way out to the field in the future. As part of this process, Resident Engineers will have to clearly differentiate between EWOs required as a result of design error or omission, as opposed to EWOs beyond the control of the designer - to make certain that designers are not rated poorly due to EWOs for which they were not responsible. To that end, it is suggested that all EWOs be classified into three general categories, based on their cause, at the time that the Resident Engineer fills out the initial CSD-683 form: (1) design error or omission; (2) unforeseeable condition; or (3) change in scope requested by the Department. It would be helpful if major overruns/underruns and time extensions were classified in a similar way. (Note: The ROD form has not yet been finalized by the Construction Division.)

Attachment 7: This is a sample printout from an improved A&E Review Board data base, based on the evaluation system described above. The Board could use these evaluations to assist them in selecting the most qualified firms for a particular type of work. For instance, if looking for a consultant to design a complex bridge job, the A&E Review Board could query the consultant data base for the firm(s) with the highest bridge quality ratings. As in the case of Attachment 7, the Board could also query the data base for all evaluations for a specific consultant, to determine how the firm rates in various technical areas. It shows how well the consultant compares to all other prequalified A/E firms in terms of roadway, bridge, environmental and other work, and includes data on the constructibility of the firm's designs as well. (For instance, this sample shows that Designer Corp. performs very well for bridge work, but quite poorly in terms of environmental work.) It also shows trends in designer performance; such as a steady improvement over time (especially important in evaluating less experienced firms). Although "quality" ratings are just one of the measures used by the A&E Review Board, this type of information will lead to better selections, which will lead to better quality designs which, in turn, will lead to less review time and fewer cost overruns in the field.

Attachment 8: This bar chart shows Attachment 7 data in graphical form; that is, how a specific consulting firm (Designer Corp.) compares with the industry as a whole. Although this chart does not show anything new, it is sometimes easier to visualize strengths and weaknesses (compared to the industry average) in this format. A chart such as this may also be useful to send to the principals of consulting firms, at the discretion of the A&E Review Board and Chief Engineer, so that they can see for themselves the quality of work that their staff is providing to the Department. By identifying their weaknesses, they will be able to take steps through recruiting, training and better managing to improve in these areas.

DEVELOPMENT AND IMPLEMENTATION

Although the framework for this evaluation system was initially prepared by the A&E Review Board, it has been developed and improved based on considerable input from ACEC and others. Several meetings were held with ACEC members, through the MHD/ACEC Partnership, between March 1996 and April 1997. Once the Task Force reached consensus on the plan, it was discussed with MHD managers to ensure that it met their divisional needs. Finally, the system was presented to MHD staff involved in the review process through two workshops, one for Project Managers and another for reviewers. Their comments were incorporated into the final system design.

The Department is now in the process of putting the new evaluation system into place. Project managers are using the revised forms and the A&E Review Board has developed a new data base for collecting and analyzing the information. Consultant evaluations recently submitted in the "old" (i.e. poor to excellent) format are being prorated into the "1 to 10 scale" scoring basis by the A&E Review Board. Over the course of the next couple of months, implementation should be completed.

It needs to be recognized up front that the real benefits of this system are long term, once there are enough designers and projects in the data base to make true comparisons and useful queries. In the short term, all reviewers will feel that their input does make a difference, the A&E Review Board will have more complete data to assist them in making selection decisions, and designers will have better feedback regarding the quality of their work. It is important that all those involved have realistic expectations so that they will not become discouraged, which could eventually lead to apathy and poor input.

Finally, this is just one piece of the puzzle in terms of improving the quality of consultant designs. Other ideas such as "quality assurance" reviews, random "quality audits," constructibility reviews and cost recovery have all been discussed in various forums, and all should eventually be considered together as part of a comprehensive long term solution for improving quality at all levels.